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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,547	08/13/2001	Masumi Kubo	829-583	7121

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EXAMINER

CHOWDHURY, TARIFUR RASHID

ART UNIT PAPER NUMBER

2871

DATE MAILED: 02/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/927,547

Applicant(s)

KUBO ET AL.

Examiner

Tarifur R Chowdhury

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29 and 32-34 is/are rejected.
- 7) ☒ Claim(s) 30 and 31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/220,792.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/220,792, filed on December 28, 1998.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.
3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

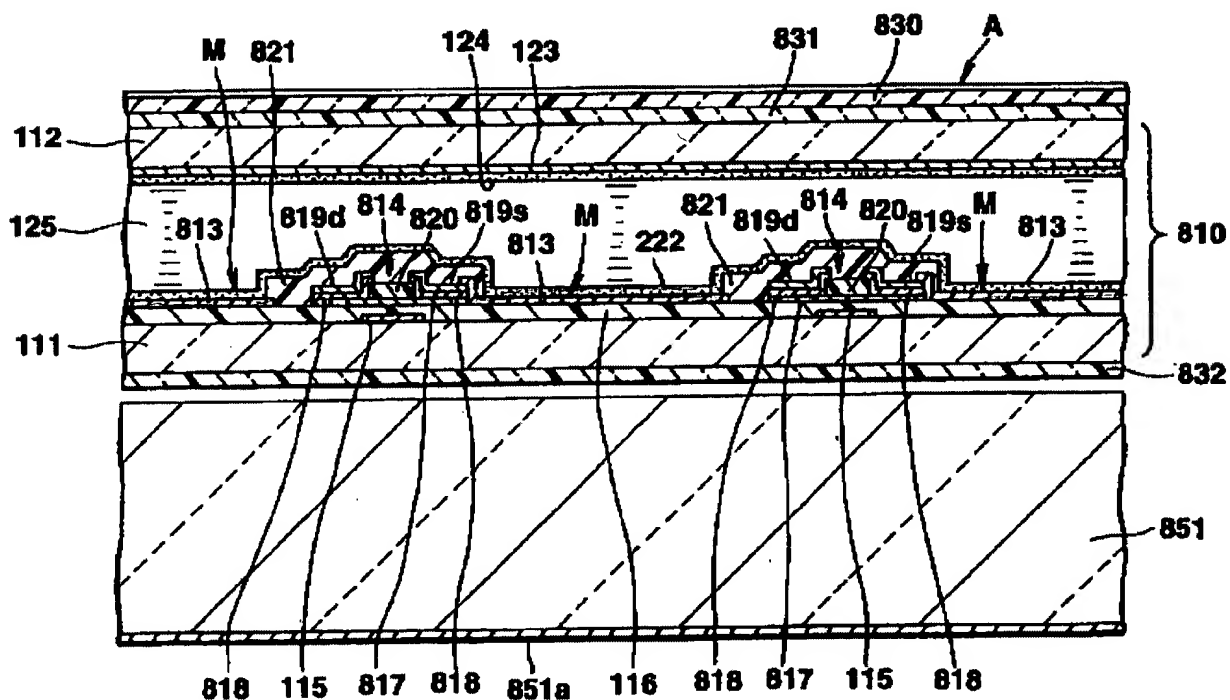
This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 32 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al., (Yoshida), USPAT 5,724,112.

Yoshida discloses and shows in Figure 11 (reproduced below), a liquid crystal display device comprising:

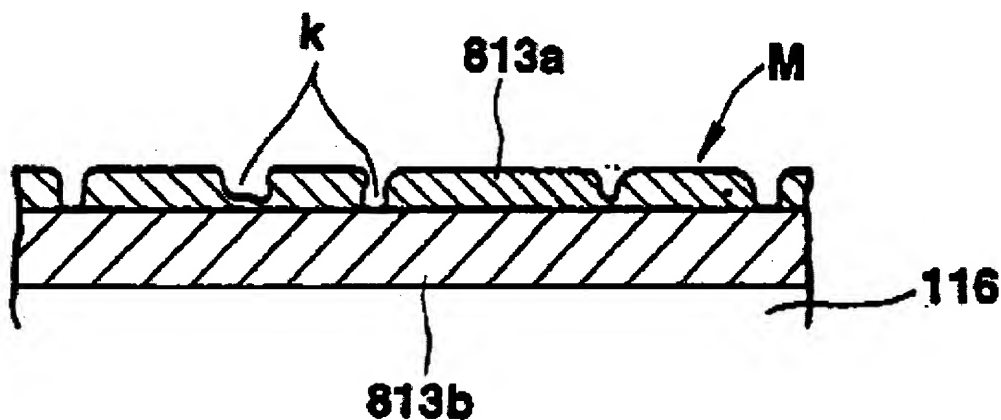
FIG.11

- a first substrate (112) and a second substrate (111);
- a semitransparent reflection film (M) provided on the second substrate (111);
- a liquid crystal layer (125) interposed between the first and the second substrate; and

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- a plurality of pixel areas provided for display, each of the plurality of pixel areas including a reflection area for performing display using reflective light and a transmission area for performing display using transmitted light;

Yoshida further discloses and shows in Figure 14 (reproduced below) that the semitransparent reflection film (M) comprising an ITO layer (813b) (applicant's first conductive layer) is provided in the transmission area and a metal thin film such as Al or Al alloy or the like (813a) (applicant's second conductive layer) having high reflectance is provided in the reflection area are formed in correspondence with each pixel area on the second substrate (111), the ITO layer and the metal thin film are formed as independent layers to each other (col. 21, line 41 – col. 22, line 6; col. 22, lines 44-57; col. 24, lines 13-24; col. 25, line 20-25).

FIG.14

Further, ITO is known to have high transmission efficiency.

Accordingly, claim 32 would have been obvious.

As to claim 34, it is also clear from Figure 14 that the ITO layer (13b) and the metal layer (13a) are electrically connected with each other.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Hsieh et al., (Hsieh), USPAT 5,743,980.

Yoshida also shows in Figure 11, a liquid crystal display device comprising:

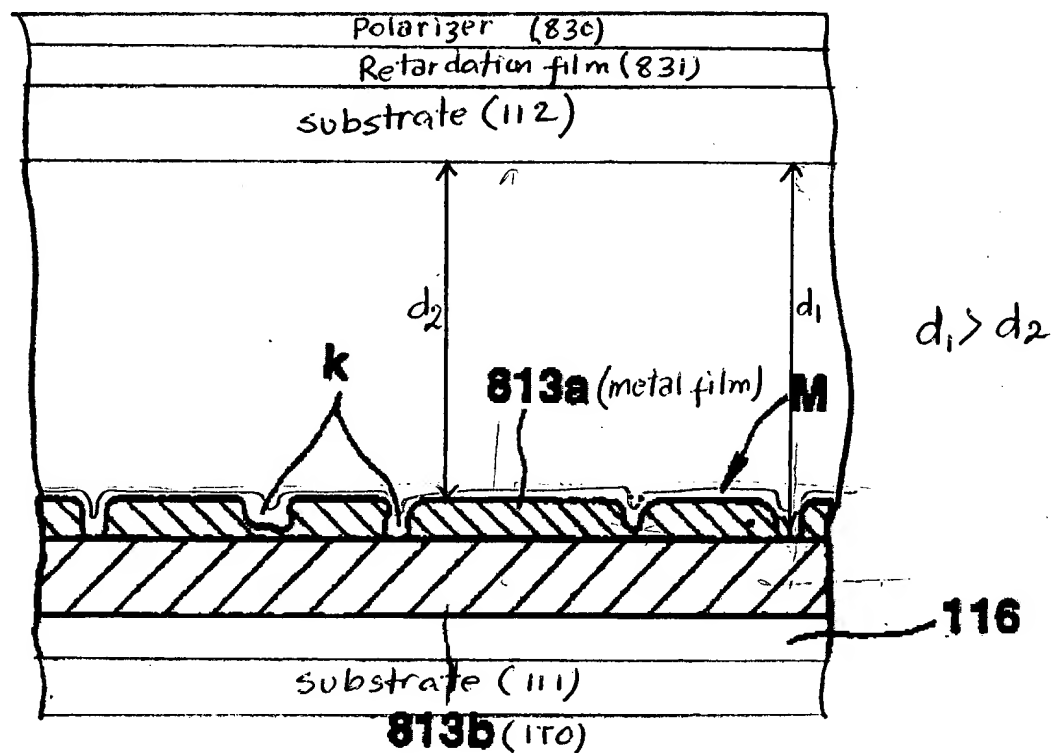
- a first substrate (112) and a second substrate (111);
- a liquid crystal layer (125) interposed between the first substrate and the second substrate;
- a first polarizer (830) provided on a surface of the first substrate (112) which is on the opposite side of the liquid crystal layer (125);
- a second polarizer (832) provided on a surface of the second substrate (112) which is on the opposite side of the liquid crystal layer (125);
- a retardation plate (831) (applicant's first phase compensation element) provided between the first polarizer (830) and the liquid crystal layer (125);

Wherein the semitransparent reflection film M is formed of an ITO layer (813b) (applicant's transmissive electrode region defining the transmission area) and a metal layer (813a) (applicant's reflective electrode region defining the reflection area), which are in correspondence with each pixel area on the second substrate (111) (Fig. 14).

Further, it is clear from Figures 11 and 14, that the transmissive electrode region is formed closer to the second substrate than the reflective electrode region. Thus, a thickness (d1) of the liquid crystal layer in the transmissive electrode region and a

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thickness (d_2) of the liquid crystal layer in the reflective electrode region are defined by a relationship $d_1 > d_2$. (Please see the following Figure, reproduced by the examiner omitting the details and considering the semitransparent transparent film (M) including an ITO layer and a metal layer, as suggested by Yoshida in Fig. 14)



Yoshida differs from the claimed invention because he does not explicitly disclose a second phase compensation element being provided between the second polarizer and the liquid crystal layer.

Hsieh discloses a liquid crystal display including an optical retardation film (2') (applicant's phase compensation element) between a bottom polarizer (3) (applicant's second polarizer) and a liquid crystal cell (2) (Fig. 3). Hsieh further discloses that by

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placing an optical retardation film between a polarizer and a liquid crystal cell, it is possible to improve the viewing angle.

Hsieh is evidence that ordinary workers in the art of liquid crystal would find a reason, suggestion or motivation to employ a phase compensation element between the second polarizer and the liquid crystal layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the display of Yoshida such that employing a phase compensation element between the second polarizer (32) and the liquid crystal layer (26) so that the display will have the advantage of improved viewing angle, as per the teachings of Hsieh.

Accordingly, claims 29 would have been obvious.

5. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida as applied to claims 32 and 34 above, and in view of Nishiyama, USPAT 4,097,131.

6. Yoshida differs from the claimed invention because he does not explicitly disclose that an insulation layer is provided between the ITO layer and the metal layer.

Nishiyama discloses a liquid crystal display with an insulating layer being formed between the transparent electrode of ITO and a reflective coating of aluminum (Al) (Fig. 2). Nishiyama further discloses that formation of a transparent insulator between the aluminum reflective coating and the indium oxide coating is advantageous since it will physically separate and insulate the two layers and thus prevent contamination by way

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of migration and absorption of indium to the aluminum as well as prevent pin hole replication. (col.1, line 67 – col. 2, line 24).

Nishiyama is evidence that ordinary workers in the art of liquid crystal would find a reason, suggestion or motivation to employ an insulating layer between the transparent layer and the reflective layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the liquid crystal display device of Yoshida by employing an insulating layer between the transparent layer (applicant's pixel electrode) and the reflective layer (applicant's reflective electrode) in order to physically separate and insulate the two layers and thus prevent contamination by way of migration and absorption of indium to the aluminum as well as prevent pin hole replication, as per the teachings of Nishiyama.

Accordingly, claim 33 would have been obvious.

Allowable Subject Matter

7. Claims 30 and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

None of the prior arts alone or in combination discloses the claimed liquid crystal display device wherein a thickness (d1) of the liquid crystal layer in the transmissive electrode region a thickness (d2) of the liquid crystal layer in the reflective electrode

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region are defined by a relationship $d1 = 2*d2$ or $d1 > 2*d2$, including all the other recitations of the base claim.

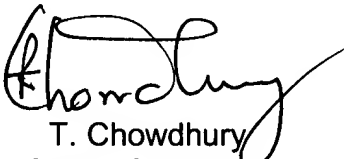
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tarifur R Chowdhury whose telephone number is (703) 308-4115. The examiner can normally be reached on M-Th (6:30-5:00) Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William L Sikes can be reached on (703) 305-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

TRC
February 11, 2002


T. Chowdhury
Patent Examiner
Technology Center 2800